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KEEPING UP WITH THE NEIGHBORS: NONPROLIFERATION AND  
IMPLEMENTATION OF UNSCR 1540

by

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## **Biography**

Sean Frederick Conroy is the Chief, Air National Guard Director's Action Group. He is responsible for supporting the Director, Deputy Director, and Executive Director of the Air National Guard in their engagements and tasks. He is serving temporary duty as a student at the Air War College, Air University, Maxwell AFB, AL. Mr. Conroy previously served as the Associate Director of Air, Space and Cyber Operations (NGB/A3) for the National Guard. As such, he was the senior civilian responsible for National Guard Bureau support for operations, training, and deployment of 105,400 air guardsmen assigned to 89 wings and 579 mission support units spanning 54 states, territories, and the District of Columbia. Prior assignments include Analysis Branch Chief in the Air National Guard Plans and Programs Directorate (NGB/A8A9) and uniformed service in the United States Air Force. He earned an undergraduate degree from the University of Maine, and master's degrees from the United States Marine Corps Command and Staff College and the USAF School of Advanced Air and Space Studies.

## **Abstract**

Liberal international relations theories predict that states with respect for the rule of law will more readily comply with their international obligations. This paper tests this prediction against compliance within the nonproliferation regime and specifically with UNSCR 1540, a resolution mandating that member nations enact domestic legislation to counter proliferation of weapons of mass destruction and certain dual use technologies. Using a rule of law measure based upon contract intensive money, the findings lend strong support for a positive relationship between rule of law states and compliance with nonproliferation norms. However, there is no support for the relationship between rule of law and implementation of specific UN-mandated tenets of UNSCR 1540. The influence of regional compliance is strong across both models. This study contributes to an understanding of the predictors of regime compliance, lending support to liberal theory and even the democratic peace literature.

*No threat poses as grave a danger to our security and well-being as the potential use of nuclear weapons and materials by irresponsible states or terrorists.*

2015 US National Security Strategy

*This institution was founded because men and women who came before us had the foresight to know that our nations are more secure when we uphold basic laws and basic norms, and pursue a path of cooperation over conflict.*

President Barack Obama  
Remarks to the UNGA, September 28, 2015

## Introduction

The international community has long sought to limit the spread of weapons of mass destruction (WMD). The most significant efforts have been codified as multilateral agreements—“security regimes”—signed by states, such as the Nuclear Non-proliferation Treaty (NPT), the Convention on Toxin and Biological Weapons (BTWC), and the Chemical Weapons Convention (CWC).<sup>1</sup> Even though efforts to negotiate and ratify these agreements occur at the international level, their success depends upon the behavior of actors within the domestic sphere. Non-state groups and even individuals have stated their desire to acquire WMD, and this possibility remains a key concern of U.S. policy.<sup>2</sup> There is therefore a gap between the obligations incurred by national governments and the potential actions of individuals and groups that have not made these commitments on their own. In order to bridge this gap, states can create domestic enablers to support international regimes. Among the domestic enablers is codification of the regime’s tenets in domestic law.

In order to understand whether non-proliferation regimes are likely to be effective, we must identify the factors that allow for the domestic enforcement of these agreements. This effort is part of a larger project that seeks to answer: *What predicts the success of the non-proliferation regime?* While this regime is comprised of a number of international agreements, I focus on

examining one in particular: United Nations (UN) Security Council Resolution 1540. This resolution is a rare mandate enforceable through the collective security authority found in Chapter VII of the UN Charter.<sup>3</sup> It also contains specific provisions mandating implementation in a way that should make their efforts easier to observe. The resolution applies to all states, and targets potential sub-national actors (e.g. terrorist groups) who may seek to acquire WMD. Consequently, it serves as a good case for examining the relationship between international legal responsibilities and domestic enforcement efforts.

I conduct this analysis using novel quantitative data on regime implementation and compliance. Results reveal a significant link between the nature of states' domestic politics, and the breadth and depth of their commitments to an important non-proliferation effort. The implications for policy are clear: actors who seek to control the spread of WMD must be mindful of the domestic context in which these regimes are enforced. Before I begin the analysis of Resolution 1540, however, I examine security regimes more generally in order to highlight the benefits and challenges associated with these agreements.

## **Regime Definition**

Regimes are one way in which groups, including states, attempt to influence behavior across many different activities. As Stephen Krasner noted, regimes are “sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actor expectations converge in a given [issue] area of international relations.”<sup>4</sup> Harald Müller observed that, “A regime exists when all four elements can be identified and when the regime controls enough variables in a given issue area to affect (if obeyed) parties’ behavior by channeling or terminating self-help with regard to the regulated variables.”<sup>5</sup> Regimes attempt to influence state behavior across many different activities with the goal of predictability and cooperation; each

regime consists of rules governing the behavior of the regime members. Both states and non-governmental organizations can be members of regimes, though the legal authority to enforce agreements rests predominately with states. This research considers the nonproliferation regime and the institutions – specifically the UN – that support it.

The actors that Krasner described are sovereign nations.<sup>6</sup> Regimes are important because they enhance the operation of the international political system in the absence of a centralized government.<sup>7</sup> Regimes thus can cause friction within and among states because they limit state sovereignty by placing constraints on state action.<sup>8</sup> Regimes govern the actions of the members within the specific issue-area, serving as a political authority within the international system in that they represent a convergence of “principles about fact, causation, and rectitude, as well as political rights and obligations that are regarded as legitimate.”<sup>9</sup>

Regimes can also affect non-state actors because they “order and absorb the mobilized participation of new and old states as well as non-state actors.”<sup>10</sup> Regimes cover many areas in which non-state actors are among the primary participants. The ability of a regime to influence both states and non-state actors highlights the fact that regimes focus on specific issue-areas rather than merely providing broad guidance for state behavior. “The boundaries of issue areas are determined by the perceptions of the participating actors.”<sup>11</sup>

## **Regime Formation**

There are three types of regimes, each determined by the circumstances under which they were formed: spontaneous, negotiated, and imposed.<sup>12</sup> Spontaneous regimes simply reflect a convergence of expectations among members.<sup>13</sup> Negotiated and imposed regimes are the two types of regimes generally found in the security arena. The characteristics of a negotiated regime include high transactions costs in initial bargaining and a tendency toward greater restrictiveness

over time.<sup>14</sup> The nature of a negotiated regime is that of contract, which specifies the obligations of the parties across a domain of potential circumstances.

Hegemons, or even victors in a war, sometimes impose regimes. The hegemon's influence is among the forces behind an "uninterested" nation's accession to a regime.<sup>15</sup> The ability of a number of powerful states, like those that comprise the permanent five (P-5) in the United Nations Security Council (UNSC), to impose conditions on other UN member states is similar. As Young observed, "[w]here several actors share power as well as a strong interest in the activity...regimes are likely to emerge from bargains struck among small groups of key players."<sup>16</sup> This is the situation encountered by the NP regime. A small number of actors on the UNSC – mostly the P-5 – are the most influential in a regime that encompasses a large majority of the world's nations.

Ideally, regimes form around shared interests; cooperation in the management of such interests yields better results than could be obtained through individual policy pursuit.<sup>17</sup> When a regime forms around a security issue like non-proliferation, member nations make an assumption that every other member nation shares the value placed upon the issue.<sup>18</sup> Discussion of the formation and content of regimes must therefore look at both the convergence of the power behind the regime formation and the legitimate social purpose for the regime.<sup>19</sup> In the case of the counter- and non-proliferation regimes, the social purpose of preventing the proliferation of WMD drew the sources of power together.<sup>20</sup> Collaboration among nations is a way to prevent any individual nation from maximizing strength by gaining access to and increasing their share of WMD. Thus, security regimes demand that individual nations give up security potential they could realize through WMD possession.

## **UNSCR 1540**

During September 2003, President George W. Bush spoke at the UN and advocated a deeper commitment to NP. He called for nations “to criminalize the proliferation of weapons of mass destruction, to enact strict export controls consistent with international standards, and to secure any and all sensitive materials within their own borders.”<sup>21</sup> The content of his speech mirrored the US-conceived Proliferation Security Initiative (PSI) that led to UNSCR 1540.

UNSCR 1540 is a unique Security Council initiative. First, this resolution is one of general applicability, rather than narrowly focused on a single nation or event. It provides an umbrella over the other NP treaties – mentioning them by name – but does not require a nation to accede to any treaty. UNSCR 1540 calls upon member nations to establish and enforce domestic legislation to counter the proliferation of WMD to non-state actors. This is a unique encroachment of state sovereignty in that, rather than relying upon the process by which a state accedes to a treaty and implements the treaty’s provisions, the state’s membership in the UN compels the state to adopt the provisions.<sup>22</sup> Third, UNSCR 1540 specifically references terrorists and targets non-state actors. The UNSC adopted UNSCR 1540 under Chapter VII of the UN Charter, entitled *Action with Respect to Threats to the Peace, Breaches of the Peace, and Acts of Aggression*. Chapter VII is that part of the UN Charter that authorizes the use of force to settle disputes.<sup>23</sup> UNSCR 1540 was only the second time that the UNSC used this authority for a functional threat (as opposed to a state-specific threat); the previous time was the UNSCR 1373, a post-9/11 counter-terrorism measure.<sup>24</sup>

Using Chapter VII was a source of conflict in the enabling debates; some nations voiced alarm that compliance through coercion was now a possibility.<sup>25</sup> The US, Spain, France, Chile, New Zealand, Japan, and Mexico put forth the following argument: Chapter VII is the foundation for subsequent actions and the invocation of Chapter VII authority in the resolutions

sends a serious political signal to the members of the United Nations General Assembly (UNGA).<sup>26</sup>

What are the practical expectations of UNSCR 1540? First, each nation has reporting requirements; nations will report, fail to report, or fail to report with a reason.<sup>27</sup> Second, under UNSCR 1540 nations must adopt enabling legislation or report on its pre-existence. Again, they may simply do nothing. Finally, nations must enforce the legislation. As before, this may not happen. None of the steps presupposes the others; a nation with pre-existing legislation may fail to report and yet enforce anyway. Third, a nation needs to enforce the legislation. Using UNSCR 1540 as a framework for measuring regime compliance allows for clear definition of outcomes and, more importantly for this paper, provides a better measurement of regime success. In addition to requiring adoption of domestic enabling legislation, UNSCR 1540 contains reporting requirements, and a recognition of the norms contained in the NPT, CWC, and BTWC.

## **Hypotheses**

The literature strongly suggests that the nature of the domestic constituency, if supportive of the regime, contributes to increased compliance. In a review of international regime theory, Stephan Haggard and Beth Simmons argued, “foreign policy is integrally related to domestic structures and processes.”<sup>28</sup> These same structures control the ability of the state to sustain compliance to regimes to which it has committed.<sup>29</sup> A later quantitative study by Simmons using compliance with the International Monetary Fund’s standards and obligations, found that nations with rule of law-based principles were more likely to comply with the commitments inherent in regime membership.<sup>30</sup> In this study, domestic respect for laws translated to international respect for laws and fulfillment of regime requirements because nations would avoid damaging a reputation for respect of laws.<sup>31</sup>

Emilia Justyna Powell and Jeffrey Staton used the Convention against Torture (CAT) as a lens through which they studied compliance with the human rights regime.<sup>32</sup> They made a rule of law assumption that “states that possess judicial institutions that protect property rights are likely to have judicial institutions that protect rights generally.”<sup>33</sup> Their findings also support the premise that once a state commits to an international agreement, respect for rule of law, evidenced by a judicial system with independence and enforceability to protect property rights, will increase the chances the state will comply with that agreement.<sup>34</sup>

UNSCR 1540 is a piece of the NP regime. This paper analyzes the assumption that domestic legislation will prove effective in NP efforts as member nations institutionalize its tenets. Respect for the rule of law is critical for the success of the NP regime. I predict that nations that exhibit a strong commitment to the rule of law will have increased compliance with both the NP regime and implementation of UNSCR 1540.

H1a: Countries that value the rule of law – strong court system, sound political institutions, plans for orderly succession, stable contract enforcement, and independent judiciaries - will exhibit increased compliance with the NP Regime.

H1b: Countries that value the rule of law – strong court system, sound political institutions, plans for orderly succession, stable contract enforcement, and independent judiciaries - will exhibit increased implementation with UNSCR 1540.

Nations that are members of a regime share agreement on the principles and norms of the regime. The existence of many agreements supporting nonproliferation as well as UNSCR 1540 indicates the existence of an international norm that disfavors proliferation of WMD.<sup>35</sup> Yet the regime does not exhibit a universal commitment to counter- and non-proliferation. Enforcement is nonexistent in some states and uneven in others, especially in comparison to other nations. Within this paper, I argue that increasing scores on NTI’s Nuclear Materials Security Index (NTI

Index) is a good proxy for institutionalization. I work to validate the idea that increased institutionalization helps predict regime success.

The hypotheses distinguish between compliance and implementation. Compliance with the principles and norms of a regime and institutionalizing the regime's tenets is possible without formally becoming a signatory to a regime. The opposite is also true; a nation can exhibit full implementation of the regime's rules and procedures without compliance with the principles and norms. These hypotheses, therefore, attempt to capture more comprehensively predictors of a nation's intent and actions.

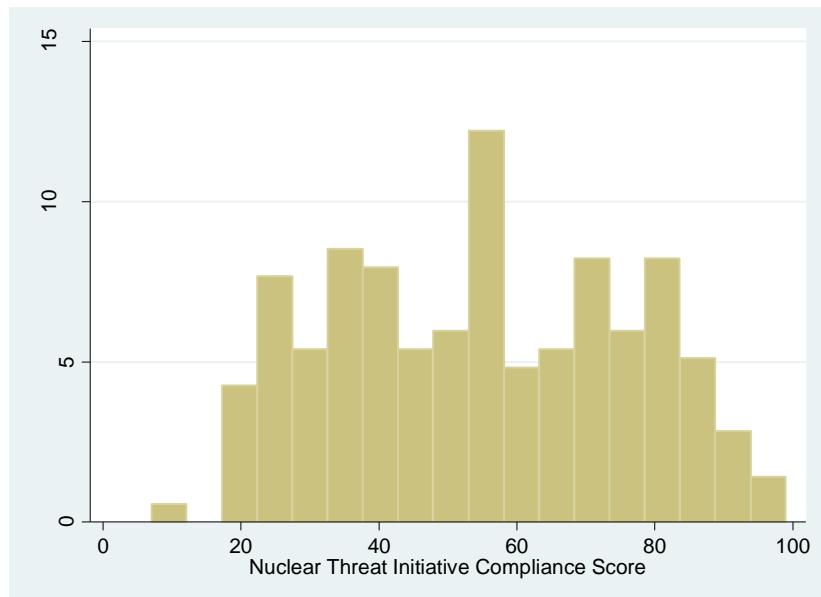
## **Testing Compliance**

Based upon the previously discussed characteristics of successful regimes, I identified quantitative and qualitative predictors of NP Regime compliance. The dependent variable highlights the implementation of UNSCR 1540: increased barriers to proliferation due to an obligation for states to enact domestic legislation to counter proliferation of WMD to non-state actors. Regression analysis is used to identify the factors that predict changes in compliance with NP norms across the domain of states in the international system. I use the NTI Index as a proxy for a nation's compliance with the NP regime. Compliance encompasses the measures that states take to ensure effectiveness of international accords in domestic law.<sup>36</sup> Increasing compliance levels is evidence of institutionalization of the principles and norms of the NP regime.<sup>37</sup> The NTI Index separates 176 nations into two categories: 25 states with one kilogram or more of weapons grade nuclear materials and 151 states with less than one kilogram. For the 25 states with one kilogram of weapons grade nuclear material or more, the NTI Index assesses the following: (1) Quantities and Sites, (2) Security and Control Measures, (3) Global Norms, (4) Domestic Commitments and Capacity, and (5) Risk Environment. For the 151 nations without

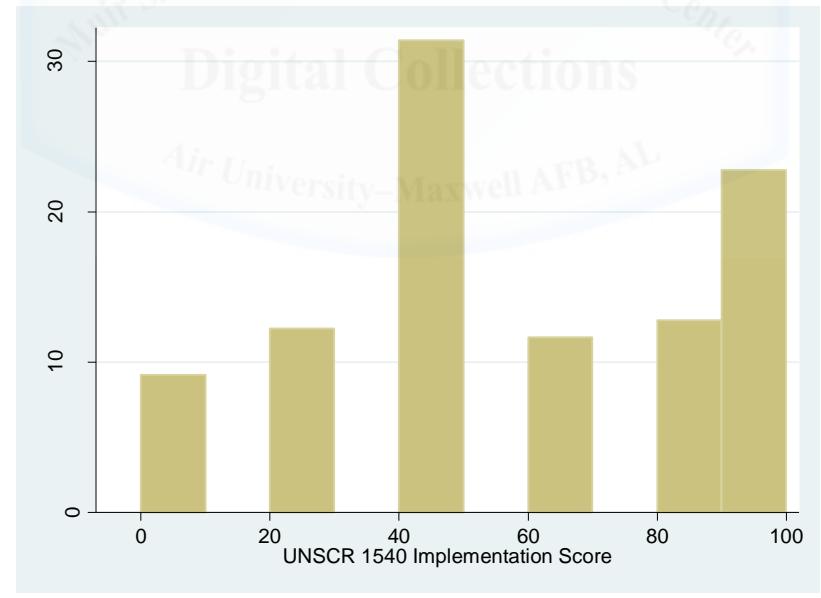
the threshold level of nuclear material, the NTI Index only measures the last three categories. This is a qualitative score (except for amount of nuclear material) derived from 19 indicators and 56 sub-indicators within the 5 categories. Appendix A contains a complete breakout of indicators and sub-indicators. Lending to strength and standardization, in a further attempt to remove human error, the sub-indicators are generally binary. Scores can range from 0 to 100, though no nation is at either of those extremes. The NTI Index covers 2012 and 2014.<sup>38</sup> Figure 1 illustrates the distribution of the NTI Index.

Among the 19 indicators in the NTI Index is UNSCR 1540 Implementation (in the Domestic Commitments and Capacity category) which includes UNSCR 1540 reporting and the Extent of UNSCR 1540 Implementation as sub-indicators. Consequently, I coded a second dependent variable based on this indicator (NTI\_1540\_n). This is an ordered variable with values from 0 to 100 in intervals of 10. Hypothesis 1b uses a different dependent variable, a narrow look at the implementation of UNSCR 1540 – one of the 19 components of the greater NP regime. Hypotheses 1b predicts increased UNSCR 1540 implementation due to increased rule of law. Figure 2 depicts the distribution of the dependent variable based upon UNSCR 1540 Implementation.

**Figure 1: Distribution of the NTI Index**



**Figure 2: Distribution of the UNSCR 1540 Implementation Variable**



The variables that predict compliance - as expressed in the NTI Index - encompass two categories. These measures include both a rule of law indicator, and regional proportional compliance.

The rule of law indicator is Contract Intensive Money (RoLCIM). Clague, Keefer, Knack, and Olson studied the relationship between contract enforceability and national economic performance. They defined CIM as “the ratio of non-currency money to the total money supply.”<sup>39</sup> In a study of human rights treaty compliance, Powell and Staton used a Contract Intensive Money (CIM) measure as well as three measures developed from the US State Department’s (DoS) annual human rights reports. The CIM measure illustrates the trust that a nation places in the judiciary to enforce property rights such as those envisioned in a contract.<sup>40</sup> CIM measures cash-to-contract obligations and determines a rule of law ratio based upon the risk investors are willing to assume. Higher numbers represent a greater trust from “citizens, domestic and international businesses and banks,” in the governmental system to enforce banking obligations.<sup>41</sup> Hard currency is less necessary for investment protection in states with a high CIM score. This measure directly relates to the Powell and Staton study that bound norm compliance rule of law state containing a judiciary that strongly enforced property rights.<sup>42</sup>

I created this variable using the same methods as Clague, et.al. Using the International Monetary Fund’s (IMF) International Financial Statistics (IFS), I created the CIM measure used in this analysis by subtracting M1 from M2 then dividing by M2 [(M2-M1)/M2.] The US Federal Reserve defines M1 as the most liquid component of the money supply, as it primarily consists of cash and other on-demand forms of money.<sup>43</sup> M2 includes elements of money that are less liquid, such as savings deposits, money markets, and mutual funds that are not as suitable for rapid exchange.<sup>44</sup> The variable derived from these measures of money directly relates to the rule of law and the confidence investors have in the enforcement of contract. In countries with weaker rule of law indicators, individuals will be more reliant on cash.

In addition, I test the effect of Competitiveness of Participation (ParComp) a variable I take from the Polity IV dataset. This variable measures the amount of participation by parties and individuals opposed to the ruling regime the governmental system allows. It is coded from 1 to 5 which corresponds to the following categories that indicate national government situations that span from no competitiveness through regular participation by enduring political groups: repressed, suppressed, factional, transitional, or competitive.<sup>45</sup>

Patricia Weitsman and George Shambaugh used the ParComp variable in a study of governmental risk-taking between 1816 and 1992. They found a strong association between conservative governmental decision-making and not only democracies, but specifically those democracies with highly competitive political systems.<sup>46</sup> In addition, Bruce Bueno de Mesquita, et.al. found a significant relationship between increased participation and competition and compliance with human rights norms.<sup>47</sup> I predict that increased competitive participation within a nation's government will predict increased compliance with the nonproliferation norm and specifically with UNSCR 1540 implementation.

In studying the commitment and compliance with the International Monetary Fund's Article VIII requirement for unrestricted exchange (essentially disallowing restriction on things like imports or cash outflow) Beth Simmons found across both the international system and the region, commitment increased as the proportion of committed states increased.<sup>48</sup> I use the Proportion of Regional compliance measure to control for the effects of regional influence. These variables – calculated from different data for each DV - predict that as the compliance percentage of states in a region rises, additional states will also comply. Essentially a high percentage of adhering nations will yield additional adherence through increased institutionalization locking in the principles and norms of the NP Regime. I predict that regional

compliance in both the NP regime and specifically in implementing UNSCR 1540 will have a positive effect within the region. As a result, I develop another measure that averages the compliance or implementation scores for each major region in the world (North America, South America, Europe, Africa, Middle East-North Africa, and the Asia-Pacific).

This dataset contains information on 180 nations, the vast majority of the world. With this dataset I am trying to determine which factors influence members of the risk set to comply with the mandates of UNSCR 1540. What follows is the regression form of the models:

$$H1a: Compliance_{(NP\ Regime)} = \beta_0 + \beta_{Rule\ of\ Law} + \beta_{Competitive\ Participation} + \beta_{Regional}$$

$$Compliance + e$$

$$H1b: Compliance_{(UNSCR\ 1540\ Implementation)} = \beta_0 + \beta_{Rule\ of\ Law} + \beta_{Competitive\ Participation} + \beta_{Regional\ Compliance} + e$$

Appendix B captures and summarizes all of the variables and sources within this paper.

This table illustrates problems encountered both with using temporal proximity to the observations. The rule of law measure, contract intensive money, suffers from lags in reporting and calculations within a nation's monetary system. In time, these data will improve through reporting and investigation. This model captures the essential predictors of regime implementation and allows the researcher to identify a nation's shortcomings when that nation fails to comply with the tenets of the regime. With a better understanding, one can credibly determine whether a regime is, or has the potential to be, successful.

## Analysis

I ran a number of regression analyses on the data. Because of the limited data set, I chose to run this with a bootstrap in order to increase the reliability of the results.<sup>49</sup> Both analyses exhibited solid goodness-of-fit indicators, however, this may result from the effect of the

regional compliance control variable. Table 2 summarizes the results from the regression analysis:

**Table 2: Regression Results**

| Variable                         | H1a: NTI Index |           |                       |                   |        | H1b: 1540 Implementation Score |           |                       |                   |        |
|----------------------------------|----------------|-----------|-----------------------|-------------------|--------|--------------------------------|-----------|-----------------------|-------------------|--------|
|                                  | Coeff          | Std Error | P> z                  | 95% Conf Interval |        | Coeff                          | Std Error | P> z                  | 95% Conf Interval |        |
| <b>Contract Intensive Money</b>  | 13.101         | 4.614     | .005                  | 4.058             | 22.144 | 4.432                          | 6.099     | .467                  | -7.522            | 16.386 |
| <b>Competitiveness w/in Govt</b> | .264           | .064      | .000                  | .139              | .388   | .297                           | .113      | .008                  | .076              | .517   |
| <b>Regional Compliance Mean</b>  | .966           | .041      | .000                  | .886              | 1.047  | 1.112                          | .062      | .000                  | .991              | 1.233  |
| <b>Constant</b>                  | -2.526         | 3.627     | .486                  | -9.635            | 4.583  | -4.667                         | 5.511     | .397                  | -15.469           | 6.136  |
| <b>Goodness of Fit</b>           | $R^2 = .580$   |           | Adjusted $R^2 = .574$ |                   |        | $R^2 = .613$                   |           | Adjusted $R^2 = .608$ |                   |        |

Hypothesis 1a used compliance with the NP regime as a dependent variable (NTI Index).

This hypothesis predicted that as a nation exhibited a greater respect for the rule of law, compliance with the NP regime would increase. The results from the regression analysis lend support to this hypothesis and indicate a strong relationship between compliance with the NP regime and all three variables, rule of law, political competitiveness, and regional proportional compliance. In those nations that have a strong judiciary and enforcement processes such that monetary transactions need not be cash only, we can expect a high compliance with the NP regime. Nations that must depend upon cash transactions – since credit lacks enforceability – will exhibit lower rates of NP compliance. There is also a strong relationship between compliance and the political competitiveness within a government. This indicates that democracies with a high competitive participation score will tend to comply with the NP regime. The control variable of regional compliance indicates a strong regional relationship among nations. Nations tend to mirror their region and either increase NP regime compliance with their neighbors or remain low as a region. These findings are consistent with prior uses of these variables. A nation that exhibits strong rule of law tendencies through an enforceable banking

system should tend to comply with international norms. The risks of non-compliance, including sanctions, are too costly.

Despite the strength of the relationship between Contract Intensive Money and NP Compliance, this variable does not have a statistically significant impact on UNSCR 1540 implementation (see Table 2/H1b). The fact that money is safe, and contracts enforceable in functioning courts, does not predict implementation with the specifics of UNSCR 1540. However, the competitive political participation and regional mean variables retain significance. These results indicate that a nation could be respectful of the rule of law and a competitive participatory democracy, yet fail to implement UNSCR 1540, just like its neighbors.

## **Discussion and Conclusions**

This paper began with a look at the NP regime and a relatively new part of it, UNSCR 1540, a mandate for UN member nations to enact and enforce domestic legislation criminalizing the proliferation of WMD and dual-use technologies by non-state actors. The proliferation of WMD by non-state actors presents a threat to all nations and the system as a whole. Successful NP efforts benefit all. This paper contains a new approach to measuring and finding the factors important to compliance. Using the Nuclear Threat Initiative Index and select subcategories, the analyses focused on the role of rule of law and the competitiveness of participation, with regional implementation as a control.

The results of this paper indicate a strong relationship between each of these indicators and a nation's compliance with the overall NP regime. As nations become more stable in monetary transactions, their compliance will increase. For most nations, stable transactions and good governance leads to additional international transactions - potentially opening markets and

opportunities for trade. Similarly, a political system that includes and encourages competition among many participants supports compliance with the NP regime.

Using the specific implementation of UNSCR 1540 as a dependent variable yielded surprising results. The rule of law measure was insignificant, yielding explanatory power to the presence of a participatory government and the regional compliance. This indicates that a nation can institutionalize the NP norms, yet fail to comply with the specifics of implementation. Using Krasner's definition as a lens to observe these results reveals nations in concert with the principles and norms, but not complying with the rules and decision-making procedures.<sup>50</sup> Of course, compliance with the latter two categories is easier to measure.

While these results are positive, the data and analysis are not without criticism. The years studied are 2012 and 2014. For many nations, the 2014 data are either preliminary or incomplete. The IMF continues to refine the information based on their normalizing and verification procedures following receipt. Additionally, the Eurozone is not as homogenous as the data make it appear. The 19 members of the Eurozone report similar rule of law measures which, though accurate, does not reveal anything about the differences among these nations. The NTI Index itself has differences in that there are additional subcategories in the scores for the 25 current nations, and 31 nations in 2012 that possess 1 kilogram or more of weapons grade nuclear material. Breaking out the Eurozone and the nuclear nations and conducting analyses on them and the remaining nations will potentially reveal differences in analysis results.

The results in this paper lend support to liberal theories of peace and the international system. Regimes dilute the central power of a state and limit the effect of self-interested decision-making without directly challenging sovereignty.<sup>51</sup> The passing of UNSCR 1540 drives directly toward domestic politics and, necessarily, a liberal view of the international system.

Liberal institutionalists believe that regimes bridge the differences between states and encourage increased dialogue. UNSCR 1540 specifically does not demand accession to any treaty; however, the mandate for domestic legislation limits the sovereignty of some nations and places them on the path to compliance with the NP regime. This paper contributes to liberal theories of international relations because the results tie domestic actions to system cooperation for a common good.

## Notes

<sup>1</sup> These concerns are especially relevant in the context of international security regimes, which endanger individual states and the world in general. The types of security regimes include arms control regimes, communication regimes, and non- and counter- proliferation regimes. Non-proliferation (NP) and counter-proliferation (CP) regimes focus on stopping the spread of WMD, some conventional weapons, and the component parts of both. Used throughout this paper, the term non-proliferation includes the use military and nonmilitary means to not only “stop, slow, and roll back [WMD] programs,” but also “prevent the acquisition of [WMD] by dissuading or impeding access to or distribution of, sensitive technologies, material, and expertise.” Barry R. Schneider, *Future War and Counterproliferation: U.S. Military Responses to NBC Proliferation Threats* (Westport: Praeger Security International, 1999), 47. United States Department of Defense, *Joint Publication 1-02, DOD Dictionary of Military and Associated Terms*, October 15, 2015 <http://www.dtic.mil/doctrine/jel/doddict/> (accessed December 5, 2015).

<sup>2</sup> Rolf Mowatt-Larsen, “Al Qaeda’s Pursuit of Weapons of Mass Destruction,” *Foreign Policy*, January 25, 2010, <http://foreignpolicy.com/2010/01/25/al-qaedas-pursuit-of-weapons-of-mass-destruction/> (accessed February 9, 2016); United States National Security Strategy, 2015, [https://www.whitehouse.gov/sites/default/files/docs/2015\\_national\\_security\\_strategy.pdf](https://www.whitehouse.gov/sites/default/files/docs/2015_national_security_strategy.pdf) (accessed January 19, 2016).

<sup>3</sup> Samantha Pitts-Kiefer and Page Southland, *NTI Nuclear Materials Security Index: Building a Framework for Assurance, Accountability, and Action, Second Edition* (Nuclear Threat Initiative, 2014), <http://ntindex.org/wp-content/uploads/2014/01/2014-NTI-Index-Report.pdf> (accessed December 4, 2015).

<sup>4</sup> Stephen D. Krasner, “Structural Causes and Regime Consequences: Regimes as Intervening Variables,” in *International Regimes*, ed., Stephen D. Krasner (Ithaca: Cornell University Press, 1983), 2.

<sup>5</sup> Harald Müller, “The Internalization of Principles, Norms, and Rules by Governments: The Case of Security Regimes,” in *Regime Theory and International Relations*, ed. Volker Rittberger (Oxford: Clarendon Press, 1993), 361.

<sup>6</sup> Oran R. Young, “International Regimes: Problems of Concept Formation,” *World Politics* 32 (April 1980): 333.

<sup>7</sup> Robert O. Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy*, 2005 ed. (Princeton: Princeton University Press, 2005), 63.

<sup>8</sup> Oran R. Young, “International Regimes,” 343.

<sup>9</sup> John Gerard Ruggie, “International Regimes, Transactions and Change: Embedded Liberalism in Postwar Economic Order,” in *Theory and Structure in International Political Economy: An International Organizational Reader*, ed. Charles Lipson and Benjamin J. Cohen (Cambridge: The MIT Press, 1999), 246.

<sup>10</sup> Roger K. Smith, "Institutionalization as a Measure of Regime Stability: Insights," *Millennium: Journal of International Studies* 18, no. 2 (1989): 234.

<sup>11</sup> Manfred Efinger and Michael Zürn, "Explaining Conflict Management in East-West Relation: A Quantitative Test of Problem-Structural Typologies," in *International Regimes in East-West Politics*, ed. Volker Rittberger (London: Pinter, 1990): 68.

<sup>12</sup> Oran R. Young, "Regime Dynamics: The Rise and Fall of International Regimes," in *International Regimes*, ed. Stephen D. Krasner (Ithaca: Cornell University Press, 1983), 97.

<sup>13</sup> Oran R. Young, "Regime Dynamics," 98.

<sup>14</sup> Oran R. Young, "Regime Dynamics," 105.

<sup>15</sup> Keohane recognized that hegemons are not always necessary for regime formation noting that "[e]ven if no hegemon exists, a small number of strong actors may be able to accomplish...[the] task together." Robert O. Keohane, *After Hegemony*, 50-51, 77.

<sup>16</sup> Oran R. Young, "International Regimes," 355.

<sup>17</sup> Robert O. Keohane, *After Hegemony*, 79, 80.

<sup>18</sup> Robert Jervis, "Security Regimes," in *International Regimes*, ed. Stephen D. Krasner (Ithaca: Cornell University Press, 1983), 177.

<sup>19</sup> John Gerard Ruggie, "International Regimes, Transactions and Change," 248.

<sup>20</sup> John Gerard Ruggie, "International Regimes, Transactions and Change," 250. Ruggie uses the post-1971 economic order as an example of non-hegemonic concurrence of social purpose.

<sup>21</sup> George W. Bush, "Address to the United Nations," September 23, 2003.

<http://www.presidentialrhetoric.com/speeches/09.23.03.html> (accessed November 11, 2015).

<sup>22</sup> United Nations Security Council, *Resolution 1540 (2004)*, 28 April 2004

[http://www.un.org/en/ga/search/view\\_doc.asp?symbol=S/RES/1540\(2004\)](http://www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/1540(2004)) (accessed November 11, 2015).

<sup>23</sup> Chapter VII of the UN Charter is entitled *Action with Respect to Threats to the Peace, Breaches of the Peace, and Acts of Aggression*. Of course, the UN tries to resolve differences without force, but Article 42 of Chapter VII states that the Security Council "may take such action by air, sea, or land forces as may be necessary to maintain or restore international peace and security." United Nations Charter, 24 October 1945; <http://www.un.org/en/sections/un-charter/chapter-vii/index.html> (accessed November 11, 2015). Practically speaking, however, substantive sanctions are the usual first substantive step following noncompliance. For comparative purposes, Chapter VI of the UN Charter is the more commonly invoked; Chapter VI calls for pacific resolution of disputes and does not contain authority for the use of force or sanctions. Thus, Chapter VII authority is the more powerful and a bold step for the UN.

<sup>24</sup> Peter van Ham and Olivia Bosch, "Global Non-Proliferation and Counter-Terrorism: the Role of Resolution UNSCR 1540 and Its Implications," in *Global Non-Proliferation and Counter-Terrorism: The Impact of UNSCR 1540*, Olivia Bosch and Peter van Ham, eds. (Washington: Brookings Institution Press, 2007), 8.

<sup>25</sup> Peter van Ham and Olivia Bosch, "Global Non-Proliferation and Counter-Terrorism," 7.

<sup>26</sup> United Nations Security Council, "Speakers in Security Council Debate on Weapons of Mass Destruction Express Doubts over Content of Proposed Non-proliferation Text," Press Release SC/8070Security Council 4950<sup>th</sup> Meeting, April 22, 2004, at <http://www.un.org/press/en/2004/sc8070.doc.htm> (accessed November 11, 2015).

<sup>27</sup> "[C]alls upon states to present a first report no later than six months from the adoption of this resolution to the Committee on steps they gave taken or intend to take to implement this resolution."

<sup>28</sup> Stephan Haggard and Beth A. Simmons, "Theories of International Regimes," *International Organization* 41, no. 3 (1987): 499.

<sup>29</sup> Stephan Haggard and Beth A. Simmons, "Theories of International Regimes," 516.

<sup>30</sup> Beth A. Simmons, “International Law and State Behavior: Commitment and Compliance in International Monetary Affairs,” *American Political Science Review* 94, no. 4 (December 2000): 832.

<sup>31</sup> Beth A. Simmons, “International Law and State Behavior,” 820.

<sup>32</sup> Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment.

<sup>33</sup> Emilia Justyna Powell, and Jeffrey K Staton, “Domestic Judicial Institutions and Human Rights Treaty Violation,” *International Studies Quarterly* 53, no. 1 (March 2009), 159.

<sup>34</sup> Emilia Justyna Powell, and Jeffrey K Staton, “Domestic Judicial Institutions,” 167.

<sup>35</sup> Robert O. Keohane, *After Hegemony*, 58.

<sup>36</sup> Harold K. Jacobson and Edith Brown Weiss, “A Framework for Analysis,” in *Engaging Countries: Strengthening Compliance with International Environmental Accords*, ed. Edith Brown Weiss and Harold K. Jacobson (Cambridge: The MIT Press, 1998): 4.

<sup>37</sup> This is contrary to Jacobson and Brown Weiss’ assertion that “[o]ne cannot simply read domestic legislation to determine whether countries are complying,” for in this instance, the existence of legislation is evidence of implementation. Edith Brown Weiss and Harold K. Jacobson, “A Framework for Analysis,” in *Engaging Countries: Strengthening Compliance with International Environmental Accords*, ed. Edith Brown Weiss and Harold K. Jacobson (Cambridge: The MIT Press, 1998): 2.

<sup>38</sup> Samantha Pitts-Kiefer and Page Southland, *NTI Nuclear Materials Security Index*, 2, 9, 37-39, 56-58. The Domestic Commitments and Capability category specifically includes UNSCR 1540 Implementation, Domestic Nuclear Materials Security Legislation, Safeguards Adherence and Compliance, and Independent Regulatory Agency.

<sup>39</sup> Christopher Clague, Philip Keefer, Stephen Knack, and Mancur Olson, “Contract-Intensive Money: Contract Enforcement, Property Rights, and Economic Performance,” *Journal of Economic Growth* 4 (June 1999): 191.

<sup>40</sup> Emilia Justyna Powell, and Jeffrey K. Staton, “Domestic Judicial Institutions...,” 159.

<sup>41</sup> Ryan E. Carlin. “Rule-of-Law Typologies in Contemporary Societies,” *Justice System Journal*, 33(2) (2012), 154-173

<sup>42</sup> Emilia Justyna Powell, and Jeffrey K Staton, “Domestic Judicial Institutions...,” 167.

<sup>43</sup> Board of Governors of the Federal Reserve System, *Money Stock Measures – H.6*, January 7, 2016, <http://www.federalreserve.gov/releases/h6/current/default.htm> (accessed January 11, 2016).

<sup>44</sup> Board of Governors of the Federal Reserve System, *Money Stock Measures – H.6*, January 7, 2016, <http://www.federalreserve.gov/releases/h6/current/default.htm> (accessed January 11, 2016).

<sup>45</sup> Monty G. Marshall, Ted Robert Gurr, and Keith Jagers, *Polity IV Project: Political Regime Characteristics and Transitions, 1800-2013, Dataset Users’ Manual* (Center for Systemic Peace, 2014): 26-28, <http://www.systemicpeace.org/inscr/p4manualv2013.pdf> (accessed November 3, 2015); Patricia A. Weitsman, and George E. Shambaugh. 2002. “International Systems, Domestic Structures, and Risk,” *Journal of Peace Research* 39 (3), 301.

<sup>46</sup> Patricia A. Weitsman, and George E. Shambaugh. 2002. “International Systems, Domestic Structures, and Risk,” *Journal of Peace Research* 39 (3), 306.

<sup>50</sup> “[S]ets of implicit or explicit principles, norms, rules, and decision-making procedures around which actor expectations converge in a given [issue] area of international relations,” Stephen D. Krasner, “Structural Causes and Regime Consequences: Regimes as Intervening Variables,” in *International Regimes*, ed., Stephen D. Krasner (Ithaca: Cornell University Press, 1983), 2.

<sup>51</sup> Robert O. Keohane and Joseph S. Nye, *Power and Interdependence* 2nd ed. (New York: Harper Collins, 1989), 30-31.



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## APPENDIX A

### NTI Index Categories, Indicators, and Sub-indicators

#### 1. QUANTITIES AND SITES

##### 1.1. Quantities of Nuclear Materials

1.1.1. Quantities of nuclear materials

##### 1.2. Sites and Transportation

1.2.1. Number of sites

1.2.2. Bulk processing facility

1.2.3. Frequency of materials transport

##### 1.3. Material Production and Elimination Trends

1.3.1. Material production and elimination trends

#### 2. SECURITY AND CONTROL MEASURES

##### 2.1. On-site Physical Protection

2.1.1. Mandatory physical protection

2.1.2. On-site reviews of security

2.1.3. Design basis threat

2.1.4. Security responsibilities and accountabilities

2.1.5. Performance-based program

##### 2.2. Control and Accounting Procedures

2.2.1. Legal and regulatory basis for material control and accounting (MC&A)

2.2.2. Measurement methods

2.2.3. Inventory record

2.2.4. Material balance area(s)

2.2.5. Control measures

##### 2.3. Insider Threat Prevention

2.3.1. Personnel vetting

2.3.2. Frequency of personnel vetting

2.3.3. Reporting

2.3.4. Surveillance

##### 2.4. Physical Security During Transport

##### 2.5. Response Capabilities

2.5.1. Emergency response capabilities

2.5.2. Armed response capabilities

2.5.3. Law enforcement response training

2.5.4. Nuclear infrastructure protection plan

#### 3. GLOBAL NORMS

##### 3.1. International Legal Commitments

3.1.1. Convention on the Physical Protection of Nuclear Material (CPPNM)

3.1.2. 2005 Amendment to the CPPNM

3.1.3. International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT)

### 3.2. Voluntary Commitments

- 3.2.1. International Atomic Energy Agency (IAEA) membership
- 3.2.2. Proliferation Security Initiative (PSI) membership
- 3.2.3. Global Initiative to Combat Nuclear Terrorism (GICNT) membership
- 3.2.4. G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction membership
- 3.2.5. World Institute for Nuclear Security (WINS) contributions
- 3.2.6. IAEA Nuclear Security Fund contributions
- 3.2.7. Bilateral or multilateral assistance
- 3.2.8. Centers of Excellence

### 3.3. International Assurances

- 3.3.1. Published regulations and reports
- 3.3.2. Public declarations and reports about nuclear materials
- 3.3.3. Invitation(s) for review of security arrangements.<sup>1\*</sup> Physical security during transport

## 4. DOMESTIC COMMITMENTS AND CAPACITY

- 4.1. United Nations Security Council Resolution (UNSCR) 1540 Implementation
  - 4.1.1. UNSCR 1540 reporting
  - 4.1.2. Extent of UNSCR 1540 implementation
- 4.2. Domestic Nuclear Materials Security Legislation
  - 4.2.1. CPPNM implementation authority
  - 4.2.2. National legal framework for CPPNM
- 4.3. Safeguards Adherence and Compliance
  - 4.3.1. IAEA safeguards agreement (excluding Additional Protocol)
  - 4.3.2. IAEA Additional Protocol
  - 4.3.3. Facility exclusion from safeguards
  - 4.3.4. Safeguards violations
- 4.4. Independent Regulatory Agency
  - 4.4.1. Independent regulatory agency

## 5. RISK ENVIRONMENT

- 5.1. Political Stability
  - 5.1.1. Social unrest
  - 5.1.2. Orderly transfers of power
  - 5.1.3. International disputes or tensions
  - 5.1.4. Armed conflict
  - 5.1.5. Violent demonstrations or violent civil or labor unrest
- 5.2. Effective Governance
  - 5.2.1. Effectiveness of the political system
  - 5.2.2. Quality of the bureaucracy
- 5.3. Pervasiveness of Corruption
  - 5.3.1. Pervasiveness of corruption
- 5.4. Groups Interested in Illicitly Acquiring Materials
  - 5.4.1. Groups interested in illicitly acquiring materials

## Variable Descriptions and Summary Statistics

### Appendix B

| Name  | Description   | Expected Direction | Source  | Obs | Mean   | Std Dev | Min    | Max    |
|---|---|--------------------|---|-----|--------|---------|--------|--------|
| <b>Dependent Variables</b>  |   |                    |   |     |        |         |        |        |
| NTI Nuclear Materials Security Index (NTI_Index)                    | This is an ordinal measure with possibilities from 0 to 100 that evaluates legal, institutional, and implementation factors of a country's compliance with the NP regime. |                    | Nuclear Threat Initiative Database                                      | 352 | 54.792 | 21.233  | 7      | 99     |
| UNSCR 1540 Implementation (NTI_1540_n)                              | This is an ordinal measure from 0 to 100 in increments of 10; includes the sub-indicators of UNSCR 1540 reporting and Extent of UNSCR 1540 implementation.                |                    | Nuclear Threat Initiative Database                                      | 360 | 55     | 32.320  | 0      | 100    |
| <b>Independent and Control Variables</b>                            |   |                    |   |     |        |         |        |        |
| Contract Intensive Money (RoLCIM)                                   | This ratio measure between 0 and 1 shows the strength of law and order within a nation as a function demand for cash transactions.  | Positive           | International Monetary Fund's <i>International Financial Statistics</i> | 230 | .489   | .204    | .024   | .891   |
| Competitiveness of Participation (parcomp)                          | This ordinal measure identifies the competitiveness of the political system. It is coded from 1 (repressed) to 5 (competitive)  | Positive           | Polity IV Democracy Index   | 334 | .341   | 15.531  | 1      | 5      |
| Proportion of Regional Compliance NTI Index (regNTImean)            | This ratio variable is coded 0 to 1 in percentages.   | Positive           | Self-generated based upon the sample, year, and the COW regions.        | 352 | 54.793 | 15.056  | 39.128 | 80.233 |
| Proportion of Regional Compliance UNSCR Compliance (regNTI1540mean) | This ratio variable is coded 0 to 1 in percentages.   | Positive           | Self-generated based upon the sample, year, and the COW regions.        | 360 | 53.495 | 22.461  | 24.583 | 91.111 |